Climate change beliefs and savings behavior: a macroeconomic perspective

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Motivation: Anticipation of climate change impacts

Climate change is projected to incur large damages to the global economy.

- Extent of damages are highly uncertain (physical, policy)
- Savings: smooth consumption over transition, precautionary motives

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2. What are the macroeconomic implications of climate concern via capital accumulation?
3. Does disagreement over climate impacts matter during the climate transition?

Individual savings and climate change concern

Consumption-savings model: partial equilibrium response to perturbation in aggregate process

- Non-positive consumption response to increased probability of low state at any point in the future
- Role of idiosyncratic state
  - ➢ Marginal propensity to save, planning horizon
  - ➢ Expected marginal value of savings in low vs high state
- Conditional on saving: largest response for poor low-income agents

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Empirical evidence: questions on climate beliefs and savings in UK panel survey

- Positive and significant correlation between climate change concern index and savings choices
- Particularly driven by
  - extensive margin: robust to individual fixed effects
  - low income individuals

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Aggregation of micro adjustments $\rightarrow$ macro effects?

Aggregate and distributional effects of concern and disagreement

DSGE framework: extended Krusell-Smith model with two key adjustments

1. Non-stationarity: time dependent shift in aggregate variable
2. Individual beliefs over impact of trend on aggregate stochastic process

Climate change: rising global temperature increases probability of low productivity state.

Aggregate and distributional effects of concern and disagreement

DSGE framework: extended Krusell-Smith model

Key take-aways:

- Average beliefs matter for aggregate outcomes along the transition:
  - Climate concern effect: capital increases in the short-run
  - Accumulated capital partly offsets physical climate damages $\rightarrow$ endogenous impacts on output
  - Transmitted via wages: labor income $\uparrow$ asset income $\downarrow$ and inequality $\downarrow$

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  - ➢ Transmitted via wages: labor income $\uparrow$ asset income $\downarrow$ and inequality $\downarrow$
- Heterogeneous effects of disagreement
  - ➢ Less concerned endogenously become poorer over time.
  - ➢ Implications of capital accumulation for those with lower than average concern:
    - drop in interest rate: decreases asset returns, disincentivizes savings further (dominates for rich)
    - rise in wages: increases labor income (dominates for poor)
  - ➢ Comparison to analytical results in partial equilibrium:
    - Individual belief matters for savings choice of a poor agent. But: limited ability to self-insure
    - Welfare more affected by general equilibrium effects, driven by higher savings of the rich
      $\rightarrow$ positive externality of savings

Contributions to the literature

Climate change impacts on the macroeconomy

- Stochastic damages: Golosov et al. (2014), Cai and Lontzek (2019)
- Anticipation: Bilal and Rossi-Hansberg (2023), Hong et al. (2023), Bakkensen and Barrage (2022)
- Capital accumulation and savings: Barrage (2018), Fankhauser and Tol (2005)

Contribution: joint focus on individual choices and uncertainty

Disagreement over aggregate (climate) processes

- Bakkensen et al. (2023), Chen et al. (2012), Lontzek et al. (2024)

Contribution: connection to idiosyncratic state, simulated impacts along the transition path

Heterogeneous agents and aggregate risks

- Krusell and Smith (1998), Broer et al. (2022)

Contribution: Non-stationarity, novel solution for perceived law of motion

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